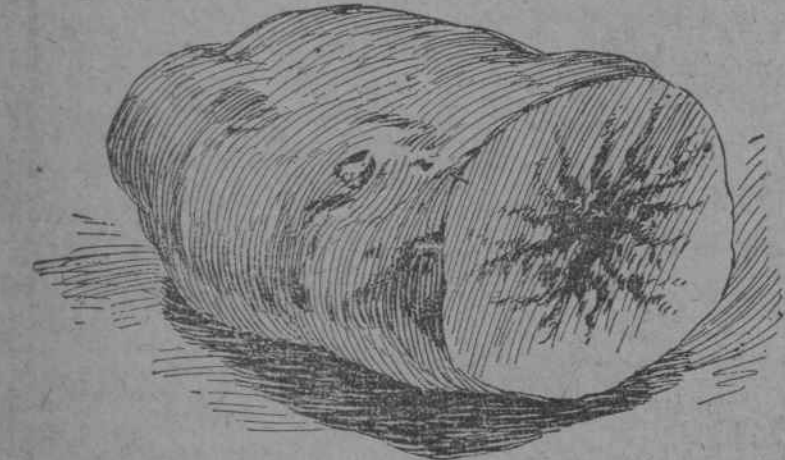


THE WHOLE WORLD ENDANGERED BY NEW YORK CITY SCIENTISTS.



A Million Deadly Germs Are Growing, Carefully Nursed by Scientists, in This Potato.
(From a photograph made especially for the Journal.)

DEADLY GERMS IN INCREDIBLE NUMBERS CAREFULLY CULTIVATED IN COOL LAB-ORATORIES.

Enough death is bottled up in New York and Brooklyn to wipe out the population of the world.

This terrible force for evil is in the hands of a few men, who have produced it in the cause of science, but who might use it in the creation of the greatest horror in the history of the earth.

Should Professor Farquhar Ferguson, the bacteriologist of the New York Hospital, be seized with homicidal mania, he could walk up to the third shelf on the north side of his laboratory, take down a glass tube five inches in length, with a stopper of absorbent cotton, labelled "Cholera Bacilli, Pure Culture, December 19, 1895," board a Sixth avenue elevated train at Fourteenth street, get off at Eighty-first street, stroll thence to the reservoir in Central Park, scale the iron fence around it, pour the contents of the vial into the water, and, in twelve hours, infect every man, woman and child on Manhattan Island with the earth's most dreadful disease. In forty-eight hours Gotham would be a city of the dead.

Or, if Professor F. C. Mitchell Prudden, director of the laboratory of the College of Physicians and Surgeons, should fall and strike his head upon the big brass fender in front of the large open fireplace in his private office, thereby causing a derangement of his power to discriminate between right and wrong, he could pick up a tube containing agar-agar, or Japanese jelly, on which a million and a quarter typhus fever germs are growing, walk to the corner of Fifth avenue and Twenty-ninth street, take the lift in the air Madison Square, and start an epidemic which would sweep every human life from the metropolis, and at the same time greatly jeopardize the inhabitants of all neighboring cities.

Nothing would be easier than for Professor Francis Delaisé, who is Professor Prudden's colleague, to be stricken with an attack of paranoia, with its usual delusion of persecution, and immediately imagine that everybody in New York was his natural enemy. Moved by the impulse of self-defence he might, some night, enter one of the crowded theatres of New York and, from a commanding position in the gallery, sprinkle a cloud of aliphatic bacilli over the audience, and thus make the terrible disease epidemic in the city, causing the speedy death of the entire population.

Professor B. Abbott Lindsey, bacteriologist of the New York Post Graduate Hospital and Medical School, has a strong mind, but even his powerful brain might succumb to some sudden shock. In such an event, there would be nothing to prevent him from loading a squirt-gun with purulent ophthalmia germs, visiting the public schools of the city, and, while delivering lectures to the pupils, secretly discharge the microbes into the air, and so destroy within four hours the eyes of every child in the room.

Dr. Ezra Wilson, the bacteriologist of the Brooklyn Department of Health, at present has on hand a very large collection of farcy, or glanders, germs. He rides all over that city in the trolley cars, and, if he should ever become a victim of a split of maniacal malicious mischief, he could, while travelling about town, free the contents of four or five culture tubes containing farcy bacilli in enormous numbers. He could thus start an epidemic of that disease which is the most contagious known to the medical profession. A horse afflicted with it is killed and cremated immediately.

Professor William Nathan Belcher, while treating surgical cases at his clinic in the Long Island College Hospital, could, if suffering at the time from some derangement of the nervous system, inoculate his patients with bacilli of anthrax or malignant pustule, which is a disease that usually kills in from three to seven days.

Dr. Vincent Gomez, visiting ophthalmologist to the Workhouse and Almshouse Hospitals on Blackwell's Island, is one of the best known eye and ear surgeons in New York City, and is noted for steadiness of his brain and hand, but, nevertheless, he might some day be suddenly seized with a mania giving rise to a desire to exterminate his fellow men. He sees nearly two hundred sufferers from eye diseases every day, and there would be nothing to prevent him, if he wished, from placing in the eye of each patient germs of erysipelas, which would not only kill all of the persons upon whom he might perform the operation, but destroy the lives of hundreds of thousands of others. If he inoculated his victims with trachoma or granular lids he could make the entire nation stone blind.

There are in the eighteen large laboratories of the two cities more than one hundred and three billions of germs, any one of which is sufficient to kill the strongest man. If the unscrupulous wizards who juggle with these micro-organisms were to let them escape from the glass tubes and come in contact with the consequences would be terrible.

It is a startling fact that the scientists of the metropolis hold the lives of all their fellow imaginative mind it presages of terrible possibilities.

1,250,000 to the square inch, the figures are necessarily approximate, but they have been made as exact as possible. The results given below must attract all the attention they deserve.

The following table is a carefully prepared list of the numbers of germs of various virulent diseases now in the laboratories of New York and Brooklyn, together with the numbers of tubes and other vessels in which they are confined:

Diseases.	Tubes.	Germs.
Consumption	6,489	8,100,000,000
Cholera	1,089	1,350,000,000
Diphtheria	2,139	2,700,000,000
Leptospira	1,089	1,350,000,000
Smallpox	1,089	1,350,000,000
Typhus fever	1,089	1,350,000,000
Hydrophobia	1,089	1,350,000,000
Anthrax	1,089	1,350,000,000
Lockjaw	1,089	1,350,000,000
Typhus fever	1,089	1,350,000,000
Yellow fever	1,089	1,350,000,000
Granular lids	1,089	1,350,000,000
Malaria	1,089	1,350,000,000
Blood poisoning	1,089	1,350,000,000
Pneumonia	2,139	2,700,000,000
Pseudo-pneumonia	5,409	6,750,000,000
Measles	5,409	6,750,000,000
Chicken pox	5,409	6,750,000,000
Relapsing fever	5,409	6,750,000,000
Erysipelas	5,409	6,750,000,000
Cerebro-spinal meningitis	5,409	6,750,000,000
Endocarditis	1,089	1,350,000,000
Chilblains	5,409	6,750,000,000
Purulent ophthalmia	1,089	1,350,000,000
Malignant dropsy	1,089	1,350,000,000
Acute yellow atrophy	1,089	1,350,000,000
Dental caries	1,089	1,350,000,000
Aspergillus	5,409	6,750,000,000
Parry	8,249	10,300,000,000
Relioli septica	5,409	6,750,000,000
Orice septica	1,089	1,350,000,000
Totals	83,169	103,250,000,000

Every one of these one hundred and three billion nine hundred and fifty millions of germs, be it remembered, is capable of causing disease, and two-thirds of them are malignant, and necessarily would cause great disaster.

So that your mad scientist, his insane cunning sharpened by his deep learning and delicate mentality, would naturally, in his homicidal mania, seek as a destructive agent that which he had been accustomed to regard throughout his medical career as more dangerous than dynamite—a germ. Let him once get the idea in his head that mankind is his enemy—presto! he grabs a handful of tubes containing literally millions of cholera, consumption, smallpox or yellow fever germs and scatters them in the air. With lightning speed they fly to the four points of the compass, each vir-

ally attacks one eye in the beginning, but quickly destroys both by auto-infection. At the onset of the disease there is rapid swelling of the lids, with a copious secretion, at first of a watery nature and rapidly taking on a pus character resembling cream. This secretion accumulates between the lids in great abundance, flows from the eye and, due to its irritating qualities, it excoriates the surrounding tissues of the face. Following this there is an invasion of the inflammatory process of the glassy portion of the eye, which is very essential to good vision. This portion ulcerates and the pus penetrates into the interior of the globe, thereby producing an inflammation of all the tissues that form part of the eye. It can be seen from this brief description of so virulent a disease that it does not take much time to blind the unfortunate who becomes its victim.

Picture a battery of bacteriologists throwing explosive shells into the British war vessels as they approach Sandy Hook. Let one shell burst on the deck of each ship, and long before the fleet reaches Quarantine every man on board will be stone blind. Not only this, but every case of purulent ophthalmia not properly and promptly attended to is dangerous to life, because the pus travels backward to the brain. So it can be seen that in time of war, when it is impossible to get enough ophthalmic surgeons to operate upon so large a number of cases as would be found in the British fleet, death would be the portion of each invader.

There might be also a section of sharpshooters who would try, when in action, to form a semicircle about the enemy. Each sharpshooter should be armed with a bacteria breech-loading rapid-fire rifle, each chamber of which should contain an explosive cartridge filled with a species of germ unlike the others. Thus, when the sharpshooter would hear the order, "Commence firing!" he would pump microbes and bacilli into the enemy's ranks something like this: "Cholera, smallpox, yellow jack, typhus, hydrophobia, consumption, diphtheria, granular lids, pneumonia, etc., through the entire practice of medicine. This would be a most useful method,

yellow. Another danger would exist in the fact that it would probably be impossible to prevent germs from flying back and killing the men who started them out to kill their enemies. Microbe warfare thus might be a boomerang. But, at any rate, it would stop war. It would kill all the fighters.

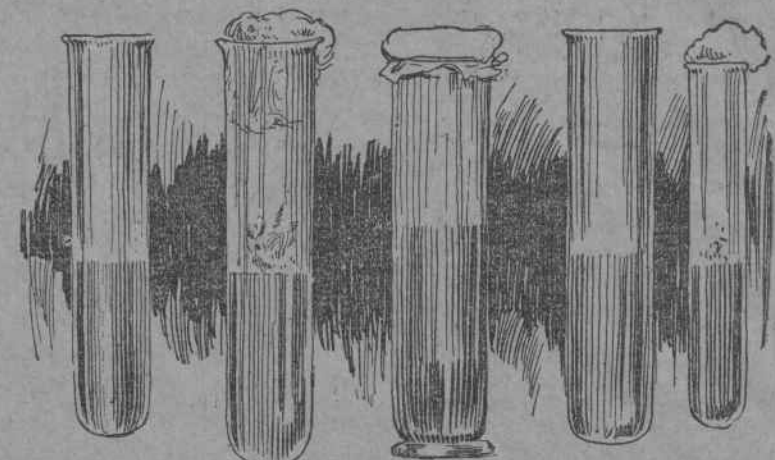
All of these germs are bred by the bacteriologists for experimental and educational purposes. Bacteriology has become in less than sixty years perhaps the most important branch of medical science. Certainly it is the most marvellous. To-day many of the greatest men in the profession are devoting their lives to the study and application of the germ theory. Without the results of their researches numerous deadly diseases would still be unknown. But for bacteriology the ordinary general practitioner, to say nothing of the specialist, would be ignorant of maladies which in the dark ages of medicine killed men like sheep—cholera, for instance.

Germ culture, therefore, is practised with as much care as the most difficult of surgical operations. The mere breeding of microbes and bacilli has been reduced to an exact science. Few laymen can appreciate, unless they have visited a germ farm, the skill, caution and patience with which the "bug men" pursue their hobby, giving painful attention to the most minute details. This microscopic exactness is absolutely essential to germ culture and to the success of all experiments.

The first and most important requirement is scrupulous cleanliness.

The germs are cultivated and fed in five different ways—on potatoes, in agar-agar (Japanese jelly), gelatine, bouillon and serum (the watery substance of the blood). In many laboratories the potato is the chief medium of culture. To prepare a potato for use as a germ bed, several things must be taken into account. A medium-sized potato is generally selected, and the bacteriologist is careful to see that it has no rotten spots. If any are found they are carefully removed. After this the potato is washed in ordinary hydrant water and thoroughly soaked in a solution of bi-chloride of mercury. Then the potato is placed in a sterilizer, where it remains in hot air for twenty minutes.

During all these preparations the hands



Death for Thousands Might Come Out of These Glass "Culture Tubes."
(From a photograph made especially for the Journal.)

A CRAZY DOCTOR COULD KILL EVERY MAN, WOMAN AND CHILD FOR MILES AROUND IN A FEW HOURS.

That indicates that the germs are getting along famously.

For germs that inhabit living organisms it is necessary to provide some culture medium that is like the juices of the human body, without being too complicated in composition. The simplest and most satisfactory medium in nearly all cases is to be found in a decoction of chopped meat, to which a little salt is added to kill any acid that may be present. The method of preparing this juice, or bouillon, is to take a definite quantity of finely minced beef, as lean as possible, and mix it up with about a quart of water.

ever, for all useful purposes, the value of the bouillon for experiment ends. Solid nourishing media are far superior to the liquid, because it is a great disadvantage to breed in liquids. For instance, a given mixture of microbes, as an infusion of putrid vegetable matter, cannot be separated in a liquid.

Inoculation is performed practically in the same way in all media. The germs are introduced on the point of a sterilized platinum needle.

Agar-agar, gelatine and serum are poured into long glass tubes before they are inoculated. The germs are generally placed on the surface of the agar-agar, but the inoculating needle is thrust deep into the gelatine.

The biggest germ farm in New York City is that in the laboratory of the Board of Health. The bacteriologists of the board use principally solid germ beds—agar-agar and gelatine. Therefore most of their microbes and bacilli are brought up in tubes. There are over 10,000 tubes in their thriving farm, and each tube contains about a million and a quarter of germs, making a total of 14,500,000,000.

Next in importance to that of the Board of Health is the germ farm of the College of Physicians and Surgeons, still known to the profession as the "P. & S.," although its legal name is now the Medical Department of Columbia College.

The two schools for graduates in medicine, the New York Polyclinic and the New York Post-Graduate Hospital and Medical School, are well supplied with germs. In the laboratory of each there is room for sixty men to work at once. Each of them has about ten billions of germs, and, as they are instructive institutions, their collections of both germs and food media are comprehensive. They have been unlucky in the matter of mortality. Not a few students have contracted consumption by inhaling the germs of that disease, and several deaths in consequence thereof have been reported. These accidents are due to the clumsiness of the students in handling the bacteria, few, if any of them, being experts.

Though the laboratory of the New York Hospital is not one of the largest, it is, probably, the best equipped, for its head, Professor Farquhar Ferguson, is one of the best pathologists in the metropolis. Among the special hospitals the New York Eye and Ear Infirmary has the best farm of microbes and bacilli that invade the eye. The Manhattan Eye and Ear Hospital, being a much smaller institution, does not go into germ culture one-half so extensively as the New York, which is the largest hospital of its kind in the world.

It is not generally known that the disease called "granular lids" is one of the most contagious of eye diseases and that it is undoubtedly caused by some micro-organism. The virus taken from granular lids of a human patient and placed upon those of a rabbit or guinea pig will, nine times out of ten inoculations, give rise to the same disease in the animal.

Another very contagious disease, and which destroys the eye sometimes in five or six hours, is a malady known as purulent ophthalmia, which is due to a microbe. The transmission of it is usually by means of towels, handkerchiefs, etc. Hence from this it can be seen how dangerous it is to use towels that are placed in public rooms.

The most important germ farm in Brooklyn is to be found in the Hoagland laboratory, which is connected with the Long Island College Hospital.

Second only to the Hoagland is the germ farm of the Board of Health. Dr. Ezra Wilson is at the head of the department of bacteriology, and he is an enthusiastic investigator. At this writing Dr. Wilson has an enormous collection of microbes of farcy, and the investigations of horses affected with glanders are carried out exhaustively with the aid of the veterinary surgeon of the department.

Third in order comes Seney Hospital, the Methodist Episcopal institution, of which Professor William Nathan Belcher is the head.

Other hospitals with flourishing germ farms are St. Mary's Hospital, the Brooklyn City Hospital, and St. Catharine's. The Brooklyn Pathological Society, too, is bringing up a fine family of bacteria, as is also the Brooklyn Microscopical Society.

Summing it all up, the case stands thus: Bacteriology has done a great deal for medical science and also, therefore, for the people, but experimental bacteriology, as it is practised in the laboratories of New York and Brooklyn to-day, is a standing menace to public safety. It is an urgent question whether the Legislature should not positively forbid the breeding of deadly germs in such huge numbers, whether all germ farms should not be expelled from thickly populated cities to small villages, or, better still, to the least crowded places. Of what use is bacteriology, though it has taught medical men a great deal about their own science, if it is to threaten to slaughter the entire human race at a moment's notice by holding over it perpetually the dangerous possibilities arising from its presence in the heart of the metropolis of billions upon billions of germs?

It is a question of life or death.



A Crazy Scientist Could Pour the Contents of One Vial into the Central Park Reservoir and Kill the Whole City.
(Sketches by a Journal staff artist.)

They might unwork a few vials, shake their contents out of their laboratory windows and in a few hours the breezes would have scattered the death-bearing germs through the atmosphere of an area occupied by more than 3,000,000 people. The air you breathe, the water you drink every day with safety could be so saturated with poison in sixty minutes that you could not consume them and live.

What if an earthquake or an explosion were to shake some of the laboratories, smash the tubes and bottles and liberate the germs? The possibility is appalling.

The Journal has just completed a census of all the germs in New York and Brooklyn. They have been classified, located, and their fatal forces estimated by careful computation. As most of them are confined in beds so thickly that they number

hundreds of millions, they are a particularly dangerous factor.

What fearful devastation these germs could wreak in the event of war! A corporal's guard of bacteriologists with rapid-fire guns loaded with germs could hold England at bay though she sent a thousand men-of-war hither to attack our coasts. A rifle mounted on the island at Norton's Point, the extreme western end of Coney Island, could sweep the sea to every direction and leave none but corpses on Her Majesty's ships. Cholera takes quickly, and so does yellow jack, and both are fatal to the majority of cases. Six hours after the bacteriologists begin firing, the British tars would be beyond human aid.

Purulent ophthalmia germs, too, would make splendid ammunition for our home guard of bacteriologists. That disease usu-

ally attacks one eye in the beginning, but quickly destroys both by auto-infection. At the onset of the disease there is rapid swelling of the lids, with a copious secretion, at first of a watery nature and rapidly taking on a pus character resembling cream. This secretion accumulates between the lids in great abundance, flows from the eye and, due to its irritating qualities, it excoriates the surrounding tissues of the face. Following this there is an invasion of the inflammatory process of the glassy portion of the eye, which is very essential to good vision. This portion ulcerates and the pus penetrates into the interior of the globe, thereby producing an inflammation of all the tissues that form part of the eye. It can be seen from this brief description of so virulent a disease that it does not take much time to blind the unfortunate who becomes its victim.

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of the "bug men" must have been as clean as soap and water and mercury could make them, so as to get rid of any micro-organisms that may not agree with the particular kind of germ to be bred on the potato.

A platinum needle, previously sterilized by heat, and covered with micro-organisms, is either thrust through the potato or rubbed over it. Then the potato is put carefully into a damp glass chamber, where it is inspected daily. The germs begin to develop immediately, and most of them are in a fair state of progress toward the end of the week. At the end of six or seven days the face of the potato assumes a decidedly red or dark green or some still more sickly hue, according to the disease with which it has been inoculated. The foreign color extends deeply into its meat.

Then it is allowed to stand for about twelve hours. In warm weather this work is done in a refrigerator.

After the bouillon has had a chance to settle, the mass is poured into a cheese-cloth bag and squeezed until all the liquid has run out. The liquid is boiled for three-quarters of an hour. Then carbonated soda is added to neutralize the acids. The liquid is boiled for an hour longer. When it is cool it is poured through a filter which has been moistened with distilled water, and a clear, almost colorless bouillon is allowed to run off.

Bouillon is very useful in cases where it becomes necessary to obtain large amounts of one special kind of microbe. The germs are placed in one or more pints of prepared sterilized bouillon, and in a few days the desired material is obtained. Here, how-